#12 3/31/04 Dbb28

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE HONORABLE BOARD OF PATENT APPEALS

In re the application of:	Group Art Unit: 2663
Guy L. Grenier et al.	Examiner: Derrick W. Ferris
Application No: 09/392,454	Attorney Docket: 91436-193
Filed: September 9, 1999	
For: ATM Protection Switching Method and Apparatus	

APPELLANT'S BRIEF UNDER 37 C.F.R. 1.192

The Assistant Commissioner of Patents
Washington, D.C. 20231
U.S.A.

Dear Sir or Madam:

The following is the Appellant's Brief, submitted in triplicate and under the provisions of 37 C.F.R. 1.192. The fee of $330 required by 37 C.F.R. 1.17(c) is enclosed.

Real Party in Interest

The real party in interest is the assignee of record, i.e. NORTEL NETWORKS LIMITED, 2351 Boulevard Alfred-Nobel, St. Laurent, Quebec, H4S 2A9, CANADA.

Related Appeals and Interferences

There are no related appeals or interferences that will directly affect, be directly affected by or have a bearing on the present appeal.

Status of Claims

The present appeal is directed to all of the pending claims in this application, namely, claims 1 - 26. All of these claims have been rejected.

Status of Amendments

No amendments have been filed after final rejection.

Summary of the Invention

The present invention relates to a method and apparatus for detecting and reacting to signal degrade (SD) in asynchronous transfer mode (ATM) networks. The invention serves as a basis for controlling ATM protection switching, i.e., the switching of traffic within an ATM network from a degraded path to a backup path to promote reliable delivery between end points.

In known ATM networks, signal degrade at the ATM layer is detected through performance monitoring (PM) flows, as for example detailed in ITU-T Recommendation I.630. A performance monitoring flow employs transmission of ATM cells across an ATM circuit (either end-to-end or along a segment of the circuit) and subsequent analysis of bit error rates (BERs) introduced into the transmitted cells to estimate SD in the ATM circuit. The PM flow operates entirely within the ATM layer. The SD estimated by a PM flow accounts for the cumulative effect of SD in the portion of the circuit along which the PM flow extends. A possible disadvantage of this approach is the delay associated with cell transmission between PM flow endpoints, which may culminate in an undesirable delay between the time at which a signal-degrading event occurs and the time at which the resulting degraded signal is detected at the ATM layer.

The present invention seeks to reduce the delay and traffic associated with known ATM layer SD detection techniques. Instead of using performance

monitoring flows at the ATM layer to estimate SD, the present invention monitors a signal degrade indicator provided by the operative physical layer protocol (e.g. Synchronous Optical Network or "SONET") of the network. When SD is indicated at the physical layer, it is assumed that SD is also present at the ATM layer (with the qualification that the detected physical layer SD may be required to exceed a predetermined threshold in order to effectively be considered to indicate SD at the ATM layer). The presence of SD at even a single network element may be considered sufficient to indicate SD at the ATM layer. The present invention thus operates in both the ATM layer and the physical layer of the network. An advantage of the present invention is speed of SD detection in comparison to the performance monitoring flow approach. Improved detection speed may result because the present invention does not depend upon the transmission of ATM cells through an entire ATM circuit, or a segment thereof, for SD detection. Another advantage is the reduction in overall traffic across an ATM circuit which may result from the elimination of PM flows.

As described above, the present invention pertains to SD detection. SD is a measure of the degree to which a connection is prone to error. Signal degrade should be distinguished from signal failure (SF), which is a measure of whether or not a connection is broken. SD traditionally manifests itself in the presence of bit errors within an ATM signal. SF, on the other hand, is typically manifested in loss of frames (LOF), loss of signal (LOS), or loss of cell delineation (LCD) at the physical layer carrying ATM traffic.

According to one aspect of the invention, there is provided in an ATM network, in which ATM traffic is carried on a physical network adhering to a physical layer protocol [e.g. SONET], a method of switching traffic transported on a working entity [14] of the ATM network to a protection entity [16] on the ATM network, comprising: a) monitoring an indicator of signal degrade [e.g. the bit interleaved parity ("BIP") code in the B3 byte of the SONET path overhead layer or in the SONET virtual tributary path overhead V5 byte as described at page 12, lines 23-28] of the working entity [14] provided by the physical layer

protocol; b) in response to detecting a degraded signal as a result of the monitoring, generating ATM cells [20] indicative of the signal degrade on the ATM network.

Issues

The issues at appeal are whether the Examiner erred in:

A. rejecting claims 1-5, 13-18, and 19-25 under 35 U.S.C. 103(a) over U.S. Patent No. 5,838,924 to Anderson et al. (hereinafter "Anderson") in view of U.S. Patent No. 6,452,906 to Afferton et al. ("Afferton"); and

B. rejecting claims 6-12 and 26 under 35 U.S.C. 103(a) over Anderson in view of Afferton and in further view of U.S. Patent No. 6,247,057 to Shimada.

Grouping of claims

Each of the following claim groups I-IX is independently and separately patentable:

Group I: Claims 1-4 and 19-20;

Group II: Claim 5;

Group III: Claims 13-15;

Group IV: Claims 16 and 18;

Group V: Claim 21;

Group VI: Claim 17;

Group VII: Claims 22-25;

Group VIII: Claims 6-7;

Group IX: Claims 8-10;

Group X: Claims 11-12; and

Group XI: Claim 26.

Argument

A. Rejection of claims 1-5, 13-18, and 19-25 under 35 U.S.C. 103(a) over Anderson in view of Afferton.

1. Claim Group I: Claims 1-4 and 19-20

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143 (rev. Feb. 2003).

The teaching or suggestion to make a claimed combination must be found in the prior art, and not based on applicant's disclosure. *In re Vaeck,* 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

As recently noted by the United States Court of Appeals for the Federal Court of Appeal, in *In Re Anita Dembiczan and Benson Zinberg* 50 USPQ 2d 1614 at 1616-17 (C.A.F.C.),

> ...it is this phrase that guards against entry into the "tempting but forbidden zone of hindsight,". ... Measuring a claimed invention against the standard established by section 103 requires the oft-difficult but

> critical step of casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then- accepted wisdom in the field. ... Close adherence to this methodology is especially important in the case of less technologically complex inventions, where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of the hindsight syndrome wherein that which only the inventor taught is used against its teacher."... Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references. [*Citations omitted*]

It is respectfully submitted that: (a) there is no suggestion or motivation to modify a reference or to combine reference teachings to arrive at any of the claims of Group I at the date the invention was made; and (b) the prior art references do not teach or suggest all the claim limitations.

(a) Lack of Suggestion or Motivation to Combine

The first claim in Group I, claim 1, is an independent claim directed to a method comprising generating ATM cells indicative of SD on an ATM network in response to monitoring an SD indicator provided by a physical layer protocol (see Appendix for full claim language).

In the final office action, the Examiner takes the position that Anderson discloses detection of signal failure defects (e.g., LOS, LOF, LDC) within an ATM network at the physical (i.e. SONET) layer. The Examiner acknowledges that Anderson does not suggest detecting signal degrade defects at the SONET layer. Indeed, Anderson discloses detecting SD at the ATM layer through performance monitoring flows, as described above in the summary of the invention.

The Examiner further notes that Afferton discloses the recognition of SD defects that are detected at a SONET/SDH network element and the generation of SONET Alarm Indication Signals ("AIS") responsive thereto in a

SONET/SDH network. The Examiner then appears to take the position that knowledge of the ability to detect SF on an ATM network at the physical layer, and the knowledge of being able to detect both SD and SF at the SONET layer would lead a person of ordinary skill to modify an ATM network to detect SD by way of the physical layer protocol and generate ATM cells indicative of signal degrade on the ATM network, as claimed. Here, the Applicant respectfully disagrees, for the following reasons.

The detection of SF on the ATM network performed at the physical layer cannot be equated to the detection of SD at the physical layer. SF at the physical layer inevitably results in a SF at the higher ATM layer. As a result, SF in an ATM network may be easily detected at the physical layer: failure at the physical layer will invariably result in failure along the ATM circuit.

In contrast, the presence or absence of SD at the physical layer is not conclusive of SD at the ATM layer. As previously noted, when SD is found to exist at in an ATM circuit using known techniques, this SD will be representative of the cumulative effect of signal degrade along all of the individual links in the ATM circuit. It is possible that each link of the circuit may not degrade the signal sufficiently by itself to trigger an alarm. Cumulatively, however, signal degrade along the links may reflect SD in the ATM connection (i.e. at the ATM layer). Put another way, the presence of SD at a network element may not truly be reflective of SD in an ATM circuit spanning the element. SD may, for example, affect portions of the SONET payload that are not subject to further signal degrade or that are not part of the ATM circuit. Conversely, an absence of SD at the SONET layer is not necessarily indicative of an absence of SD at the ATM layer. Moreover, error correction mechanisms along the ATM circuit may inhibit signal degrade at the sink of the circuit. For all of these reasons, the correlation between SD at the physical layer and SD on the ATM layer is not 100%.

Despite the imperfect correlation between physical layer SD and ATM layer SD, however, the Applicant, and only the Applicant, has recognized that it

may nevertheless be worthwhile for an indicator of physical layer SD to be used to estimate ATM layer SD. The rationale for such an approach is that ATM layer SD detection may be performed more quickly than with conventional techniques, since SD may be detected at a single network element, without any need for transmitting cells along an ATM circuit or analyzing bit error rates.

A person skilled in the art, on the other hand, would have not had any motivation to combine Anderson and Afferton to arrive at the claimed invention, as there was no recognition in the art that use of performance monitoring flows for SD detection is undesirably slow. Without this recognition, the motivation to adopt an alternative ATM layer SD detection technique, which likely has reduced accuracy as compared to known techniques, would simply not be present.

Accordingly, it is submitted that no suggestion or motivation exists to modify or combine Anderson and Afferton to arrive at claim 1 at the date the invention was made.

Turning to the remaining claims in Claim Group I, the rejection of which was also based on a combination of features from Anderson and Afferton, the same argument applies: there is no suggestion or motivation to modify a reference or to combine reference teachings to arrive at any of these claims.

(b) Failure to Teach or Suggest All Claim Limitations

"All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

With reference to claim 1, it is noted that neither Anderson nor Afferton recites generating ATM cells indicative of SD on an ATM network in response to monitoring an SD indicator provided by a physical layer protocol. This comment also applies to claims 2-4, which depend from claim 1.

Similarly, referring to independent claim 19, neither Anderson nor Afferton recites means for generating ATM cells indicative of SD on an ATM network in response to monitoring an SD indicator provided by a physical layer protocol. Also, referring to claim 20, neither references recites computer memory adapting an ATM network element to generate ATM cells indicative of SD on an ATM network in response to monitoring an SD indicator provided by a physical layer protocol.

Accordingly, as each of the claims of Claim Group I includes a claim limitation not present in Anderson or Afferton, it follows that these references cannot render these claims obvious, as the references do not teach or suggest all the claim limitations.

Conclusion re: Claim Group I

For the reasons stated above, it is submitted that no *prima facie* case of obviousness has been established in respect of any of the claims of Group I. Reversal of the Examiner's rejection of these claims under 35 U.S.C. 103(a) is therefore requested.

2. <u>Claim Group II: Claim 5</u>

Claim 5 is a dependent claim depending from claim 4 (which in turn depends from independent claim 1) and introduces the limitation that monitoring comprises calculating a bit-error-rate from SONET path overhead.

The same arguments as to lack of motivation to combine references and a failure of the references to teach or suggest all the claim limitations as were made above for Claim Group I are equally applicable to Claim Group II.

It is further submitted in respect of these claims that even if it were accepted (which it is not) that generating ATM cells indicative of SD in response to monitoring an SD indicator of a working entity provided by a

physical layer protocol is obvious, this would not necessarily render obvious the calculation of a bit-error-rate from SONET path overhead.

Accordingly, it is submitted that no *prima facie* case of obviousness has been established in respect of claim 5.

3. Claim Group III: Claims 13-15

Claim 13 is an independent claim directed to a network element for use in an ATM network (see Appendix for full claim language). Claims 14 and 15 are dependent from claim 13.

The same arguments as to lack of motivation to combine references and failure of the references to teach or suggest all the claim limitations as were made above for Claim Group I are equally applicable to all three claims of Claim Group III, with the exception that the Group III claims contain a different limitation which Anderson and Afferton fail to recite.

In particular, neither Anderson nor Afferton recites a detector for monitoring an indicator of SD of an ATM network working entity provided by a physical layer protocol.

Accordingly, it is submitted that no *prima facie* case of obviousness has been established in respect of any of the claims of Group III.

4. Claim Group IV: Claims 16 and 18

Claim 16 is a dependent claim depending from independent claim 13 and introduces the limitation that generated ATM cells comprise AIS cells. Claim 18 depends from claim 16 (see Appendix for full claim language).

The same arguments as to a lack of motivation to combine references and a failure of the references to teach or suggest all the claim limitations as were made above for Claim Group III are equally applicable to Claim Group IV.

It is further submitted in respect of Claim Group IV that, even if it were accepted (which it is not) that a network element comprising a detector for monitoring an indicator of SD of an ATM network working entity provided by a physical layer protocol is obvious, this would not necessarily render obvious generation of AIS cells indicative of SD, for the following reasons.

As known to those skilled in the art, AIS cells (e.g. ATM cells having an OAM type value of 0001 binary and a function type value of 0000 binary, as described at page 9 of the specification) are conventionally used to indicate signal failure (versus signal degrade) to downstream network elements of an ATM circuit. Such use of AIS cells is part of known ATM circuit operation referred to as "fault management".

Notably, AIS cells are not conventionally used for SD detection. The conventional approach for detecting SD in ATM circuits is performance monitoring (described above). Performance monitoring employs different types of ATM cells than are used for fault management. In particular, the ATM cells used for conventional performance monitoring may have an OAM type value of 0010 binary and a function type value of either 0000 binary (for forward monitoring) or 0001 binary (for backward monitoring). As will be clearly apparent from the distinct OAM and function type bit patterns used to identify these cells, such cells are not the same as AIS cells. This distinction would be known to a person skilled in the art.

Accordingly, because the ATM cells that are used conventionally for SD detection are not AIS cells, it is submitted that the use of AIS cells in the context of SD detection cannot be considered obvious.

5. Claim Group V: Claim 21

Claim 21 is an independent claim directed to an ATM AIS cell comprising a field including an indicator of SD on an ATM network (see Appendix for full claim language).

The same arguments as to a lack of motivation to combine references and a failure of the references to teach or suggest all the claim limitations as were made above for Claim Group III are equally applicable to Claim Group IV. The only exception is that claim 21 contains a different limitation not recited by Anderson or Afferton. In particular, neither Anderson nor Afferton discloses an indicator of SD in an ATM AIS cell.

Also, the argument presented above in respect of Claim Group IV as to the further unobviousness of using an AIS cell in the context of SD detection is equally applicable here.

For the above reasons, it is submitted that no *prima facie* case of obviousness has been established in respect of claim 21.

6. <u>Claim Group VI: Claim 17</u>

Claim 17 is a dependent claim depending from claim 14 (which itself is dependent on independent claim 13 of claim group III) and introduces the limitation that generated ATM cells comprise CP cells.

The same arguments as to a lack of motivation to combine references and a failure of the references to teach or suggest all the claim limitations as were made above for Claim Group III are equally applicable to Claim Group VI.

It is further submitted in respect of claim 17 that, even if it were accepted (which it is not) that a network element comprising a detector for monitoring an indicator of SD of an ATM network working entity provided by a physical layer protocol is obvious, this would not necessarily render obvious generation of <u>CP</u> cells indicative of SD, for the following reasons.

As known to those skilled in the art, CP cells are conventionally used to coordinate protection switching. That is, once a determination has been made to switch to a protection entity, CP cells may be exchanged between source

and sink nodes of the protected domain to facilitate switching (see ITU-T I.630, p. 21).

Notably, CP cells are not traditionally used simply to <u>indicate</u> a condition such as signal degrade, or even signal failure. In fact, CP cells are not concerned with the motivation for a switchover to a protection entity, be it SD or SF. Rather, they are simply part of the <u>mechanics</u> of the switchover.

As a result, any suggestion that the use of CP cells to indicate SD is obvious is, with respect, untenable.

7. <u>Claim Group VII: Claims 22-25</u>

Claim 22 is an independent claim directed to a method comprising generating ATM cells indicative of SD in response to monitoring an SD indicator in SONET overhead (see Appendix for full claim language). Claims 23-25 are dependent, directly or indirectly, from claim 22.

The same arguments as to lack of motivation to combine references and a failure of the references to teach or suggest all the claim limitations as were made above for Claim Group II are equally applicable to Claim Group VII. The only exception is that the Group VII claims contain a different limitation not recited by Anderson or Afferton, namely, generating ATM cells indicactive of SD in response to monitoring an SD indicator <u>in SONET overhead</u> (versus monitoring an SD indicator provided by a physical layer protocol generally).

Also, the argument presented above in respect of claim 5 (see Claim Group II) as to the further unobviousness of calculating a BER from SONET path overhead for use in ATM SD detection is equally applicable here.

Accordingly, it is submitted that no *prima facie* case of obviousness has been established in respect of any of the claims of Claim Group VII.

B. Rejection of claims 6-12 and 26 under 35 U.S.C. 103(a) over Anderson in view of Afferton and in further view of Shimada.

8. Claim Group VIII: Claims 6-7

Claim 6 is a dependent claim depending from claim 5 of Claim Group II and introduces the limitation that generating ATM cells is in response to a BER exceeding a defined threshold (see Appendix for full claim language). Claim 7 depends from claim 6.

The same arguments as to lack of motivation to combine references, a failure of the references to teach or suggest all the claim limitations, and the unobvious further limitation of calculating a BER from SONET path overhead as were made above for Claim Group II are equally applicable to Claim Group VIII. The only exception is that the references referred to under this heading include Shimada in addition to Anderson and Afferton.

For these reasons, it is submitted that no *prima facie* case of obviousness has been established in respect of any of the claims of Group VIII.

9. Claim Group IX: Claims 8-10

Claim 8 is a dependent claim depending from claim 7 of Claim Group VIII (which itself ultimately depends on independent claim 1) and introduces the limitation that the generated ATM cells comprise ATM alarm indication (AIS) cells. Claims 9 and 10 depend from claim 8.

The same arguments as to a lack of motivation to combine the Anderson, Afferton and Shimada references, a failure of the references to teach or suggest all the claim limitations, and as to the unobviousness of calculating BER from SONET path overhead for use in ATM SD detection as were made above for Claim Group VIII are equally applicable to Claim Group IX.

Also, the argument presented above in respect of Claim Group IV as to the further unobviousness of using an AIS cell in the context of SD detection is equally applicable here.

For these reasons, it is submitted that no *prima facie* case of obviousness has been established in respect of any of the claims of Group VIII.

10. Claim Group X: Claims 11-12

Claim 11 is a dependent claim depending from claim 7 (which itself ultimately depends from independent claim 1) and introduces the limitation that the generated ATM cells comprise an ATM protection switching coordination protocol (CP) cell. Claim 12 depends from claim 11.

The same arguments as to a lack of motivation to combine the Anderson, Afferton and Shimada references, a failure of the references to teach or suggest all the claim limitations, and as to the unobviousness of calculating BER from SONET path overhead for use in ATM SD detection as were made above for Claim Group VIII are equally applicable to Claim Group X.

Also, the argument presented above in respect of claim 17 of Claim Group VI as to the further unobviousness of using a CP cell in the context of SD indication is equally applicable here.

For these reasons, it is submitted that no *prima facie* case of obviousness has been established in respect of any of the claims of Group X.

11. Claim Group XI: Claim 26

Claim 26 is a dependent claim depending from claim 25 (which itself ultimately depends on independent claim 22 of Claim Group VII) and introduces

the limitation that the calculating utilize a parity check field within SONET path overhead to determine the BER (see Appendix for full claim language).

The same arguments as to lack of motivation to combine references, a failure of the references to teach or suggest all the claim limitations, and the unobvious further limitation of calculating a BER from SONET path overhead as were made above for Claim Group VII are equally applicable to Claim Group XI. The only exception is that the references being referred to under this heading include Shimada in addition to Anderson and Afferton.

For the reasons stated above, it is submitted that no *prima facie* case of obviousness has been established in respect of claim 26.

Summary

For the foregoing reasons, it is submitted that the Examiner's rejections of claims 1-26 are not well founded, and reversal of his rejections is respectfully requested.

Respectfully submitted,

Matthew Zischka
Registration No. 41,575

Smart & Biggar
438 University Avenue
Suite 1500, Box 111
Toronto, Ontario
M5G 2K8
Tel: (416)-593-5514
Fax: (416)-591-1690

Date: March 24,2004

91436-193 MZ/PAE/jbs

Appendix – Claims Currently on File

1. In an ATM network, in which ATM traffic is carried on a physical network adhering to a physical layer protocol, a method of switching traffic transported on a working entity of said ATM network to a protection entity on said ATM network comprising:

   a) monitoring an indicator of signal degrade of said working entity provided by said physical layer protocol;

   b) in response to detecting a degraded signal as a result of said monitoring, generating ATM cells indicative of said signal degrade on said ATM network.

2. The method of claim 1, further comprising:

   c) in response to said ATM cells indicative of said signal degrade, receiving said traffic on said protection entity.

3. The method of claim 2, further comprising:

   d) in response to said ATM cells indicative of said signal degrade, transmitting said traffic on said protection entity from a source network element.

4. The method of claim 1, wherein said physical network comprises a synchronous optical network ("SONET").

5. The method of claim 4, wherein said monitoring comprises calculating a bit-error-rate from SONET path overhead.

6. The method of claim 5, wherein said calculating utilizes a parity check field within said SONET path overhead to determine said bit error rate.

7. The method of claim 6, wherein said ATM cells indicative of signal degrade are generated in response to said bit-error-rate exceeding a defined threshold.

8. The method of claim 7, wherein said ATM cells comprise ATM alarm indication signal ("AIS") cells.

9. The method of claim 8, wherein said AIS cells are transmitted from a network element detecting said signal degrade to a downstream network element using an ATM signaling channel.

10. The method of claim 9, wherein said ATM signaling channel comprises an ATM protection switching channel.

11. The method of claim 7, wherein said ATM cells comprise an ATM protection switching coordination protocol ("CP") cell.

12. The method of claim 11, wherein said CP cell is transmitted within one of said working entity and said protection entity.

13. A network element for use in an ATM network, in which ATM traffic is carried on a physical network adhering to a physical layer protocol, said network element operable to cause traffic transported on a working entity of said ATM network to be transported on a protection entity on said ATM network, said network element comprising:

a detector for monitoring an indicator of signal degrade of said working entity provided by said physical layer protocol.

14. The network element of claim 13, wherein said detector generates a trigger indicative of signal degrade in response to monitoring signal degrade of said working entity.

15. The network element of claim 14, further comprising an ATM switch, in communication with an ATM processor, wherein said detector is in communication with said ATM processor, and wherein said ATM processor generates ATM cells indicative of signal degrade in response to said trigger.

16. The network element of claim 13, wherein said ATM cells comprise ATM alarm indication signal ("AIS") cells.

17. The network element of claim 14, wherein said ATM cells comprise an ATM protection switching coordination protocol ("CP") cell.

18. The network element of claim 16, wherein said AIS cells are transmitted to a downstream network element using an ATM signaling channel.

19. A network element for use in an ATM network, in which ATM traffic is carried on a physical network adhering to a physical layer protocol, said network element operable to switch traffic transported on a working entity of said ATM network to a protection entity on said ATM network, said network element comprising:

means for monitoring an indicator of signal degrade at said physical layer of said working entity provided by said physical layer protocol;

means for generating ATM cells indicative of signal degrade in response to said means for monitoring signal degrade at said physical layer.

20. Computer memory storing program instructions, adapting an ATM network element on ATM network in which ATM traffic is carried on a physical network adhering to a physical layer protocol, to:

a) monitor an indicator of signal degrade of a working entity on said ATM network provided by said physical layer protocol;

b) in response to detecting a degraded signal as a result of said monitoring, generate ATM cells indicative of said signal degrade on said ATM network.

21. An ATM cell comprising an alarm indication signal ("AIS"), embodied in a carrier wave to be transported on an ATM network, said cell comprising:

a) a field identifying said cell as an ATM AIS cell;

b) a field including an indicator of signal degrade on said network.

22. In a communications network in which ATM traffic is transported on a SONET network a method of switching traffic transported on a working ATM entity to a protection ATM entity, said method comprising:

a. monitoring an indicator of signal degrade of said working entity by monitoring an indicator of signal degrade in SONET overhead on said SONET network;

b. in response to detecting a degraded signal as a result of said monitoring, generating ATM cells indicative of the signal degrade to be transported to at least one adjacent node on said network.

23. The method of claim 22, further comprising:

e) in response to said ATM cells indicative of said signal degrade, receiving said traffic on said protection entity.

24. The method of claim 22, further comprising:

f) in response to said ATM cells indicative of said signal degrade, transmitting said traffic on said protection entity from a source network element.

25. The method of claim 22, wherein said monitoring comprises calculating a bit-error-rate from SONET path overhead.

26. The method of claim 25, wherein said calculating utilizes a parity check field within said SONET path overhead to determine said bit error rate.